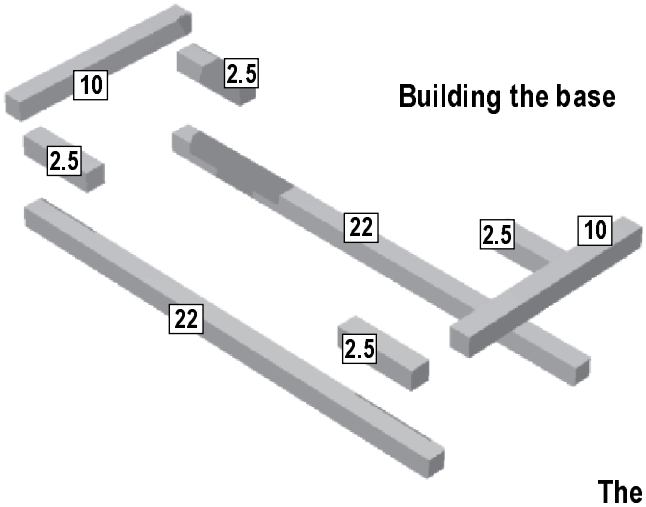
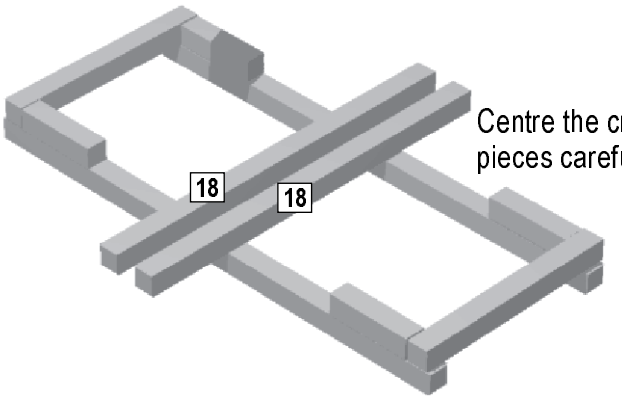
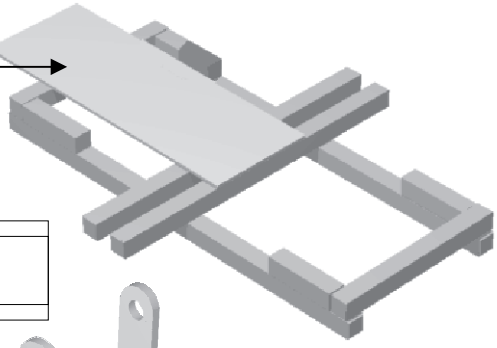


Building the base

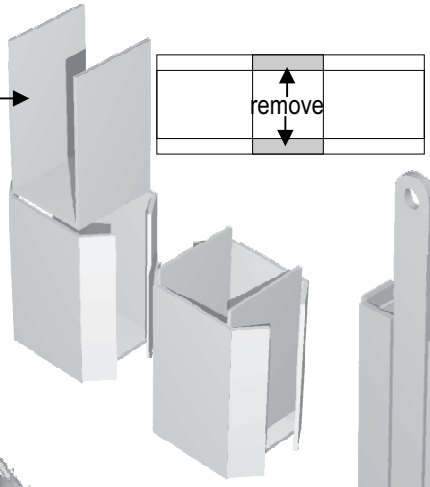


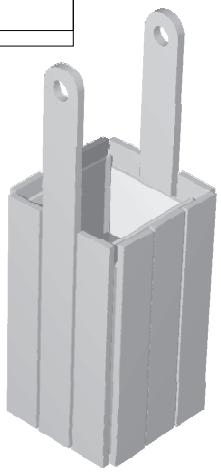
Centre the cross pieces carefully

The position of the slide
This is best left off until the 'A' frames are fitted



Fold the 2 sections of the bucket box along the scored lines. Cut out and remove the centre sections of the tabs. Glue one inside the other as shown. When the glue has set plank the box, positioning the 2 longer planks [with holes] opposite each other.



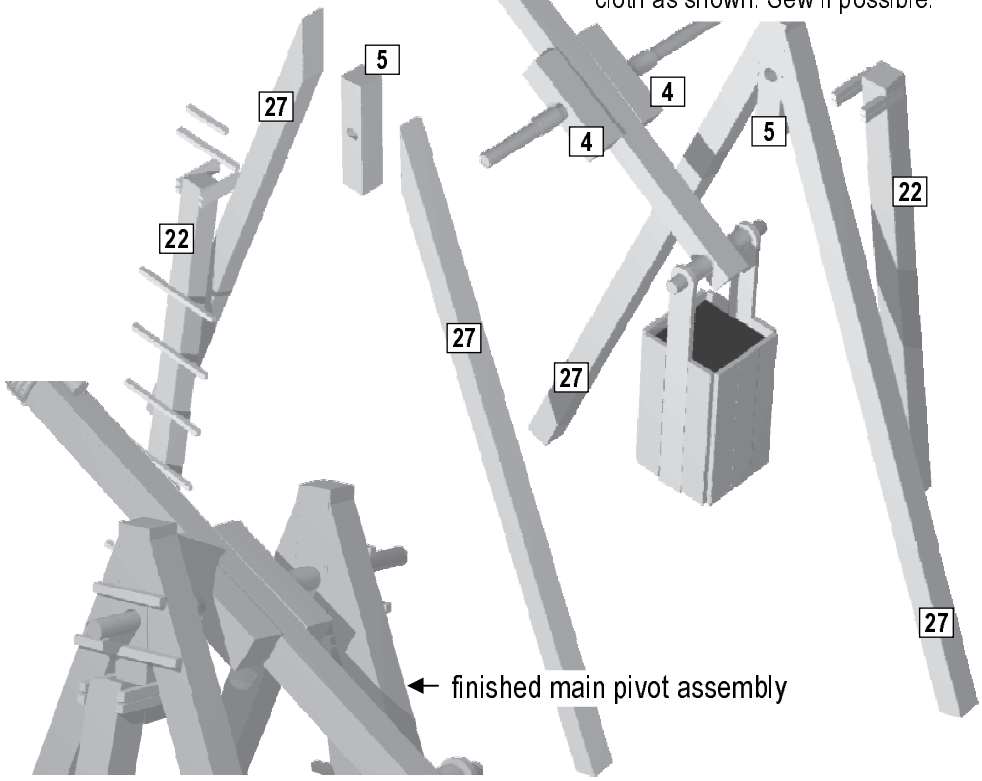


When you bind or whip the trigger wire to the dowel include the end of the sling cord. You will then be able to pull the cord to adjust to adjust its length. TIP- glue the wire to the dowel first and let the glue set before whipping.

trigger template
bend wire to this shape

22

Tie each sling cord to the sling cloth as shown. Sew if possible.



← finished main pivot assembly

1. Build the base
2. Build each A frame over template on back of cover
3. Glue 'A' frames into base with pivot dowel in place to keep them together - don't get glue on the dowel!
4. Attach buttress beams and reinforce joints with matchsticks.
5. Build the throwing arm and weight bucket
6. Attach slide and assemble components.
7. Sand up and fit ladders etc. if required.
8. Fill weight bucket.

Trebuchet Building Instructions

Your kit should contain the following pieces:-

BASE FRAME	2 sides -	22cm
	2 end pieces -	10cm
	4 blocks -	2.5cm
	2 centre cross pieces -	18cm
	1 slide -	17cm x 6cm [2mm mdf]
'A' FRAMES	4 legs -	27cm
	2 bearing blocks -	5cm [with drilled holes]
	2 buttresses -	22cm
	1 axle -	10cm dowel
THROWING ARM	1 main section -	22cm [with drilled holes]
	2 bearing blocks -	4cm [with drilled holes]
	1 dowel extension -	30cm
WEIGHT BUCKET	2 pivot arms -	10cm [with drilled holes]
	10 planks -	6cm
	1 pivot axle -	4.5cm dowel
	+ CARD x 2	

MISCELLANEOUS	1 sling cloth
	1 sling cord [with eyelet]
	string for whipping
	plastic spacers
	wire for trigger
	matchsticks

Not Included

GLUE - We used a PVA wood glue when we built the prototype trebuchet and suggest you do the same. However the clear adhesive that comes in a tube should do as well - it's up to you!

WEIGHT - We have not included any counterweights. . . - too heavy! The very first trebuchet we built used a spent dry cell battery which weighed about 150g and the last one four pieces of steel bar - about 250g. If you fill the bucket with pieces of metal (but not aluminium!) it will work. Try nuts and bolts, steel washers, coins, ball bearings, etc.

The diagrams overleaf should explain the construction of your trebuchet, but here's a few tips and 'strategies' to make it even easier.

- Begin at the bottom - build the base. Make sure that it's 'square', i.e. the corners are right angles, before you leave it for the glue to set. It also needs to dry flat remember.
  It's best to leave the fitting of the slide until after the A frames are attached, you will have more space to work.
- There is a template printed on the reverse side of the 'cover' that gives you the correct angles for the top of the 'A' frames. Build both frames over the template, one on top of the other to make sure they are the same. It will help if you fit the dowel axle through the holes in the bearing blocks. The width of the frame at the bottom shouldn't be greater than 20cm or it will not fit into the base - and don't use too much glue - you don't want the two frames to stick together!
- You will notice that matchsticks are used to reinforce the joints. Don't try to cut them to length before fixing. It's far easier to fit them whole. Once the glue is <u>really</u> dry you will be able to break or cut them to size and a little glasspaper will tidy them up.
- When you fit the frames to the base make sure that the dowel axle is fitted. This will ensure that the bearing holes line up. A tightly rolled paper tube, 6cm long, can be used as a wedge to keep the ends of the legs in position while the glue sets.
- The space between the 'A' frames needs to be kept clear to allow the arm to swing unimpeded. To support the frames two buttress pieces are used. The bottom end is glued between the centre cross pieces and the tops are secured with matchsticks.
- When you construct the throwing arm overlap the dowel and the square wood by approximately 7cm. Use plenty of glue here - this joint has too take a lot of strain when the trebuchet is fired. Support the adhesive with either tape or whipping.
- You will also need tape or whipping to secure the sling and the wire 'trigger' to the top of the arm. Use glue to support the whipping! The sling cord can be tied directly to the cloth pouch but it's better, and certainly neater, to sew and whip them together with sewing thread - again a little glue might be a useful reinforcement. Make the total length of the sling, i.e. both cords and the 'pouch' about 50cm. In other words, when the trebuchet is set up to fire the projectile should be about 25cm from the top end of the throwing arm. Once you have your trebuchet working you may like to experiment with alternative lengths of sling to see if you can improve it's performance.
- When you first try out your trebuchet use something like a wooden bead as a projectile. The smooth shape will release easily from the pouch every time and make it easier to make adjustments. Bend the wire trigger to control the release. If the projectile is thrown too steeply bend the trigger a little more. If the trajectory is too flat then straighten the trigger. Remember that when the sling is released it should be on the slide, 'under' the trebuchet. This will cause the sling to swing outwards away from the end of the arm as the arm travels up and over the body of the machine.